

NEW ENGLAND BIOASSAY, INC.

15 September 2010

Mr. Arthur Powers
Exxon Mobil Pipeline Company
Everett Distribution Terminal
52 Beacham Street
Everett, MA 02149

Dear Mr. Powers:

**ACUTE TOXICITY TEST REPORT TO
EXXON MOBIL PIPELINE COMPANY
FOR TANK NO. 140 - FIRST RAINFALL
(OUTFALL 001A) (COLLECTION DATE: 23 AUGUST 2010)**

This report contains results of one static-acute definitive toxicity test performed with the mysid, *Mysidopsis bahia*, using a sample (Outfall 001A) collected on 5 August 2010 by Exxon Mobil Pipeline Company staff from Tank No. 140 at the Exxon Mobil facility in Everett, MA. This report details the biological and chemical evaluations associated with performance of the acute toxicity test with the sample from Tank No. 140.

SAMPLE COLLECTION AND HANDLING

A grab sample was collected on 23 August 2010 by Exxon Mobil subcontractor, Triumvirate, from Tank No. 140 at the Exxon Mobil facility in Everett, MA (Table 1). The sample was to New England Bioassay (NEB) by Triumvirate personnel on 24 August at 1030 h. A copy of the chain of custody documentation is provided in Appendix A.

Upon receipt, standard wet chemistry analyses [pH, dissolved oxygen, specific conductivity, salinity, total residual chlorine (TRC), hardness, and alkalinity] were performed on the Tank 140 first rainfall sample (Table 2). On 24 August, an aliquot of the sample was warmed to the test temperature ($25^{\circ} \pm 2^{\circ}\text{C}$) and solutions for the mysid toxicity test were prepared. Because the initial salinity of the first rainfall sample from Tank No. 140 was <1 ppt, the salinity of the sample was adjusted before testing to 25 ± 2 ppt by the addition of Instant Ocean artificial sea salts to the Tank 140 first rainfall sample.

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ACUTE AND CHRONIC BIOASSAY TESTING - FRESHWATER AND MARINE CAPABILITIES
TOXICITY REDUCTION EVALUATIONS - EFFLUENT TREATABILITY STUDIES

| TABLE 1. DESCRIPTION OF A SAMPLE COLLECTED FROM THE EXXON MOBIL PIPELINE COMPANY DURING AUGUST 2010 FOR ACUTE TOXICITY TESTING | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------|-----------------------|
| Sample Description | Sample Date (Time) | Sample Type | NEB ID No. |
| Tank 140 First Rainfall Outfall 001A | 08/23/10 (1500 h) | Grab | C30-2175 |

| TABLE 2. INITIAL WET CHEMISTRY RESULTS FOR A TANK NO. 140 FIRST RAINFALL SAMPLE - OUTFALL 001B | |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Analysis Performed | Tank No. 140 First Rainfall Sample |
| pH (SU) | 7.5 |
| Dissolved oxygen (mg/L) | 8.8 |
| Sp. Conductivity (µmhos/cm) | 298 |
| Salinity (ppt) | <1 |
| TRC (mg/L) | 0.045 |
| Hardness (mg/L as CaCO ₃) | 52 |
| Alkalinity (mg/L as CaCO ₃) | 40 |
| Color | Light Yellow |

TEST METHODS

Test procedures were performed in accordance with the EPA guidance document titled "Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms" (EPA/600/4-90/027F, 1993 & EPA-821-R-02-012, 2002) and EPA New England (Region 1) Modified Methods.

The test species was the mysid, *Mysidopsis bahia* (age: 2 days old at test initiation) obtained from in-house cultures. The definitive LC₅₀ test consisted of five successive dilutions (i.e., 6.25, 12.5, 25, 50, and 100% wastewater) of the Tank 140 sample being evaluated for acute toxicity to *M. bahia*. Each concentration in the definitive test consisted of four replicates with 10 animals per replicate (40 animals per concentration); test volume per replicate was 200 mL. The mean test temperature and all individual temperature readings were 25° ± 1°C. Photoperiod was 16-h light and 8-h dark.

Natural seawater collected from Narragansett Bay (Narragansett, RI) by NEB personnel was used as dilution and control water. An aliquot of the natural saltwater used as diluent was submitted to Test America in Nashville, TN for analytical parameters specified by Exxon Mobil. Artificial seawater prepared from Instant Ocean sea salts was used as an additional quality-control check. The 48-h acute definitive test with the Tank No. 140 first rainfall sample collected on 23 August 2010 was performed during 24-26 August 2010.

To verify sensitivity of in-house cultured test organisms, a reference toxicant test using sodium dodecyl sulfate (SDS) was conducted during August 2010 with NEB's in-house cultures of *M. bahia* (test dates: 5-7 August 2010).

STATISTICAL ANALYSIS

Test data were analyzed for acute effects by determining median lethal concentrations (LC₅₀) and the acute no-observed-effect concentration (A-NOEC). The LC₅₀ is the statistically-estimated wastewater concentration which is lethal to 50% of the test organisms at the time of observation (e.g., 24 h or 48 h); the A-NOEC is the highest wastewater concentration at which there is no statistically-significant effect on the survival of the test organisms when compared with diluent control survival at the time of observation (e.g., 24 h or 48 h). LC₅₀ values were determined by using a computer package provided by the State of Connecticut Department of Environmental Protection (CTDEP).

15 September 2010

RESULTS

Tank #140

Collection Date: 23 August 2010

Results of the acute toxicity test with *M. bahia* indicated that the sample collected from Tank No. 140 on 23 August 2010 exhibited no significant acute toxicity to mysids in the 6.25% to 100% test concentrations when compared with mysid survival in the diluent control (100% at test completion) (Tables 3). At test completion (48 h), survival of mysids in the 6.25% to 100% wastewater concentrations was $\geq 90\%$. Survival of mysids in the artificial saltwater control was 98% at test completion. The 48-h LC_{50} for the mysid test was $> 100\%$ sample; the survival A-NOEC for mysids was 100% sample (Table 3).

Reference Toxicant Test

A reference toxicant test using sodium dodecyl sulfate (SDS) was conducted with NEB's in-house cultures of *M. bahia* (test dates: 5-7 August 2010). The 48-h LC_{50} for *M. bahia* was 17.7 mg/L SDS (95% confidence limits of 16.8 to 18.6 mg/L SDS; trimmed Spearman-Kärber method) indicating that the health of the test organisms was satisfactory.

If you have any questions concerning the acute toxicity test results, please contact me at (860) 643-9560.

Sincerely,



Kim Wills
Laboratory Supervisor

| TABLE 3. | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------|------------------------|------------------------------------------|------------------|
| SUMMARY OF <i>Mysidopsis bahia</i> STATIC-ACUTE TOXICITY TEST RESULTS PERFORMED ON A SAMPLE FROM TANK NO. 140 - OUTFALL 001A | | | | | |
| NEB Test ID No. | Test Species | LC ₅₀ (% effluent) | A-NOEC (% effluent) | Control Survival (%) ASW ^a | DIL ^b |
| Tank #140 First Rainfall (Test Dates: 24-26 August 2010) | | | | | |
| 30-2077 | <i>M. bahia</i> | 24 h: > 100% | ----- | 100% | 100% |
| | | 48-h: > 100% | 100% | 100% | 98% |
| ^a ASW: Artificial salt water used as laboratory water control. | | | | | |
| ^b DIL: Test dilution and control water (diluent) was natural salt water obtained from Narragansett Bay (Narragansett, RI). | | | | | |

NEB Test ID C30-2175

TOXICITY TEST SUMMARY SHEET

Facility Name: EXXON MOBIL CORPORATION Test Start Date: 08/24/10

NPDES Permit Number: MA 0000833 Pipe Number: DSN 001A

| <u>Test Type</u> | <u>Test Species</u> | <u>Sample Type</u> | <u>Sample Method</u> |
|-----------------------|----------------------------|----------------------------|-----------------------|
| <u>X</u> Acute | <u> </u> Fathead Minnow | <u> </u> Prechlorinated | <u>X</u> Grab |
| <u> </u> Chronic | <u> </u> Ceriodaphnia | <u> </u> Dechlorinated | <u> </u> Composite |
| <u> </u> Modified | <u> </u> Daphnia pulex | <u> </u> Chlorine | <u> </u> Flowthru |
| (Chronic | <u>X</u> Mysid Shrimp | <u> </u> Spiked in Lab | <u> </u> Other |
| reporting | <u> </u> Sheepshead | <u> </u> Chlorinated | |
| acute | <u> </u> Menidia | <u> </u> on site | |
| values) | <u> </u> Sea Urchin | <u>X</u> Unchlorinated | |
| <u> </u> 24 Hour | <u> </u> Champia | | |
| <u> </u> Screening | <u> </u> Selenastrum | | |
| | <u> </u> Other | | |

Dilution Water

 receiving water collected at a point upstream of or away from the discharge, free from toxicity or other sources of contamination; (Receiving water name:)

 alternate surface water of known quality and hardness, etc. to generally reflect the characteristics of the receiving water; (Surface water name:)

 synthetic water prepared using either Millipore Milli-Q or equivalent deionized water reagent grade chemicals; or deionized water combined with mineral water;

 or artificial sea salts mixed with deionized water;

 deionized water and hypersaline brine; or

X other Narragansett Bay, RI Natural Salt Water

Effluent sampling date(s): 08/23/10 @ 1500 h

Effluent concentrations tested (in %): 6.25 12.5 25 50 100

*(Permit limit concentration):

Was effluent salinity adjusted? YES

If yes, to what value? 25 ppt

With sea salts? YES hypersaline brine solution? NA

Actual effluent concentrations tested after salinity adjustment (in %): SAME

Reference Toxicant test dates: 08/5-7/10

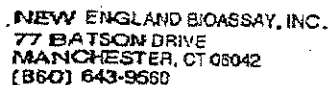
PERMIT LIMITS & TEST RESULTS

Test Acceptability CriteriaMEAN CONTROL SURVIVAL: 100%MEAN CONTROL REPRODUCTION: NAMEAN CONTROL WEIGHT: NAMEAN CONTROL CELL COUNT: NA

| <u>Limits</u> | | <u>Results</u> | |
|------------------|-------|------------------------------|--------------------|
| LC ₅₀ | _____ | 48-H LC ₅₀ | <u>> 100%</u> |
| | | UPPER VALUE | <u>NA</u> |
| | | LOWER VALUE | <u>NA</u> |
| | | DATA ANALYSIS METHOD USED | <u>OBSERVATION</u> |
| A-NOEC | _____ | A-NOEC | <u>100%</u> |
| C-NOEC | _____ | C-NOEC | <u>NA</u> |
| | | A-LOEC | <u>> 100%</u> |
| IC ₂₅ | _____ | IC ₂₅ | _____ |
| IC ₅₀ | _____ | IC ₅₀ | _____ |

APPENDIX A

**CHAIN OF CUSTODY FORMS AND
RAW TOXICITY DATA SHEETS
FOR TANK NO. 140 FIRST RAINFALL SAMPLE
(COLLECTION DATE: 23 AUGUST 2010)
AND ACUTE MYSID REFERENCE TOXICANT DATA**



| PROJECT NAME: NPDES Permit | | | | PROJECT LOCATION: ExxonMobil | | | | PROJECT NUMBER: | | | | | | | | | | | |
|-------------------------------------------------------------------------------------------------|--------------|-------------|-------------|---------------------------------------|-----------|------|--------|-------------------------------|-------------------|-------------------------|------------|------------------------------------------|--|--|--|------------------------------------------|--|--|--|
| MA0000833 | | | | Everett, MA Terminal | | | | | | | | | | | | | | | |
| SOURCE CODE: W = WELL LF = LANDFILL | | | | O = OUTFALL T = TREATMENT FACILITY | | | | RO = RUNOFF L = LAKE/OCEAN | | | | B = BOTTOM SEDIMENT X = OTHER/SPECIFY | | | | DR = DILUENT RIVER DO = DILUENT OCEAN | | | |
| NEB SAMPLE NUMBER | SAMPLE ID. | SOURCE CODE | SAMPLE TYPE | | CONTAINER | | | | ANALYSIS REQUIRED | DATE/TIME OF COLLECTION | | | | | | | | | |
| | | | GRAB | COMP. | NO. | TYPE | SIZE | PRES. | | START | END | | | | | | | | |
| CB-275 | Outfall 001A | O | x | | 1 | P | 1-gal. | none | WET | DATE: 8/27/10 | TIME: 1500 | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| | | | | | | | | | | DATE: TIME: | | | | | | | | | |
| CONTAINER TYPE: P = PLASTIC E = EPA VIAL C = CUBE G = GLASS A = AMBER GLASS B = BACTERIA BOTTLE | | | | | | | | | | | | | | | | | | | |
| PRESERVATION CODE: I = ICED F = FILTERED N = NITRIC ACID H = HYDROCHLORIC ACID (HCL) | | | | | | | | | | | | | | | | | | | |
| S = SODIUM HYDROXIDE (NaOH) T = SODIUM THIOSULFATE O = OTHER/SPECIFY | | | | | | | | | | | | | | | | | | | |
| SAMPLER SIGNATURE | AFFILIATION | DATE | TIME | TRANSFERS RELINQUISHED BY: | | | | ACCEPTED BY: | | DATE | TIME | | | | | | | | |
| [Signature] | Triunvirate | 8/27/10 | 1500 | [Signature] | | | | Courtney Zapala | | 8/24/10 | 1030 | | | | | | | | |
| ADDITIONAL COMMENTS: | | | | | | | | | | | | | | | | | | | |
| METHOD OF SHIPMENT: | | | | DATE | TIME | | | | | | | | | | | | | | |
| Hand Delivered | | | | | | | | | | | | | | | | | | | |

NEW ENGLAND BIOASSAY ACUTE TOXICITY DATA FORM
COVER SHEET FOR LC50 TESTS

CLIENT: Exxon - Mobil Corporation
 ADDRESS: 52 Beacham Street
Everett, MA
02149

M. bahia TEST ID NO: 80-2061
 COC NO: 030-2175
 PROJ NO: 196-042

CONTACT: _____

SAMPLE TYPE: Tank 140 -
 DILUENT: Narragansett Bay

EFFLUENT
 COLLECTED FROM _____ AT _____ (HOURS)
 TO 8/23/10 AT 1500 (HOURS)

INVERTEBRATE

TYPE OF TEST TEST SET-UP (TECH INIT): 03
 DEFINITIVE[X] SCREEN [] RANGE [] RENEWAL []
 TEST SPECIES: M. bahia
 NEB LOT #: Mbio (8-20)
 AGE: 4
 TEST SOLUTION VOLUME: 200 (ml)
 NO. ORGANISMS PER TEST CHAMBER: 10
 NO. ORGANISMS PER CONCENTRATION: 40
 NO. ORGANISMS PER CONTROL: 40
 START DATE: 8/24/10 AT 1325 (hours)
 END DATE: 8/26/10 AT 1240 (hours)

LABORATORY CONTROL WATER:

ARTIFICIAL SW: NEB BATCH # CK103-0110

SALINITY: 24 ALKALINITY: 110
 (ppt) (mg/L as CaCO₃)

INITIAL EFFLUENT/DILUENT CHEMISTRY: 08

| | | |
|-------------------------------------|-------------------------------|----------------------------------------------|
| TEMPERATURE (°C): <u>5.9</u> | pH (SU): <u>7.5</u> | TRC (mg/L): <u>0.045</u> |
| DISSOLVED OXYGEN (mg/L): <u>8.8</u> | HARDNESS (mg/L): <u>52</u> | ALKALINITY (mg/L): <u>40</u> |
| CONDUCTIVITY (µmhos/cm): <u>298</u> | SALINITY (ppt): <u>< 1</u> | AMMONIA: <u>NA</u> |
| SAMPLE COLOR: <u>light yellow</u> | TECH INIT: <u>M. bahia</u> | 00H: <u>03</u> 24H: <u>04</u> 48H: <u>03</u> |
| AERATION REQUIRED: YES [] NO [X] | | |

RESULTS OF M. bahia LC50 TEST

| METHOD | LC50 (%) | 95% CONFIDENCE INTERVALS |
|--------------------------|----------|--------------------------|
| BINOMIAL DISTRIBUTION: | _____ | _____ |
| MOVING AVERAGE-ANGLE: | _____ | _____ |
| PROBIT: | _____ | _____ |
| TRIMMED SPEARMAN KARBUR: | _____ | _____ |
| OTHER: | _____ | _____ |
| NOAEL: | _____ | _____ |

NOAEL: NO-OBSERVED-ACUTE-EFFECT LEVEL

COMMENTS: 57.5 g of Instant Ocean added to 2 L of effluent to bring salinity to 25 ppt
8 L of NSW diluted w/ 14 L of Kelli-Q to bring salinity to 25 ppt

REVIEWED BY: _____

DATE: _____

NEW ENGLAND BIOASSAY
ACUTE TOXICITY DATAClient: Exxon - MobilTest Species: M. bahiaTest ID #: 30-20101Sample: Tank 140Start Date: 8/24/10 at 1325 (hours)Proj #: 196-042Diluent: Narragansett BayEnd Date: 8/26/10 at 1240 (hours)

| Concentration or Dilution | | # of Live Organisms | | | Dissolved Oxygen (mg/L) | | | Temperature (°C) | | | pH (SU) | | | Salinity (ppt) |
|---------------------------|---|---------------------|----|-----|-------------------------|-----|-----|------------------|------|------|---------|-----|-----|----------------|
| | | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | |
| Lab Control | A | 10 | 10 | 10 | 7.2 | 6.0 | 6.0 | 24.0 | 24.1 | 24.4 | 8.3 | 8.1 | 8.0 | 24 |
| | B | 10 | 10 | 10 | 7.2 | 5.9 | 5.1 | | | 24.4 | | | 8.0 | |
| | C | 10 | 10 | 91* | 7.2 | 5.8 | 5.5 | | | 24.3 | | | 8.0 | |
| | D | 10 | 10 | 10 | 7.2 | 5.8 | 5.6 | | | 24.3 | | | 8.0 | |
| Diluent | A | 10 | 10 | 10 | 7.6 | 5.8 | 5.7 | 24.7 | 24.2 | 24.3 | 8.0 | 7.9 | 7.8 | 25 |
| | B | 10 | 10 | 10 | 7.6 | 5.7 | 5.3 | | | 24.3 | | | 7.8 | |
| | C | 10 | 10 | 10 | 7.6 | 5.7 | 5.3 | | | 24.3 | | | 7.7 | |
| | D | 10 | 10 | 10 | 7.6 | 5.8 | 5.3 | | | 24.3 | | | 7.7 | |
| 6.25 % | A | 10 | 10 | 10 | 7.9 | 5.5 | 5.3 | 24.9 | 24.2 | 24.3 | 7.9 | 7.8 | 7.7 | 25 |
| | B | 10 | 10 | 10 | 7.9 | 5.4 | 5.4 | | | 24.3 | | | 7.7 | |
| | C | 10 | 10 | 10 | 7.9 | 5.5 | 5.6 | | | 24.3 | | | 7.7 | |
| | D | 10 | 10 | 10 | 7.9 | 5.4 | 5.5 | | | 24.3 | | | 7.7 | |
| 12.5 % | A | 10 | 10 | 91* | 8.0 | 5.6 | 5.5 | 24.8 | 24.1 | 24.3 | 8.0 | 7.8 | 7.7 | 25 |
| | B | 10 | 10 | 10 | 8.0 | 5.5 | 5.4 | | | 24.3 | | | 7.7 | |
| | C | 10 | 10 | 10 | 8.0 | 5.5 | 5.4 | | | 24.3 | | | 7.7 | |
| | D | 10 | 10 | 10 | 8.0 | 5.5 | 5.4 | | | 24.3 | | | 7.7 | |
| Tech Initials | | CJ | CW | CJ | | | | | | | | | | |

Reviewed By: KWDate: 9/14/10

NEW ENGLAND BIOASSAY
ACUTE TOXICITY DATA

Client: Exxon - Mobil
Sample: Tank 140
Diluent: Narragansett Bay

Test Species: M. bahia
Start Date: 8/24/10 at 1325 (hours)
End Date: 8/26/10 at 1240 (hours)

Test ID #: 30-206
Proj #: 196-042

| Concentration or Dilution | | # of Live Organisms | | | Dissolved Oxygen (mg/L) | | | Temperature (°C) | | | pH (SU) | | | Salinity (ppt) |
|---------------------------|---|---------------------|----|------|-------------------------|-----|-----|------------------|------|------|---------|-----|-----|----------------|
| | | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | 0 | 24 | 48 | |
| 25% | A | 10 | 10 | 10 | 8.0 | 5.0 | 5.0 | 24.0 | 24.0 | 24.3 | 8.0 | 7.9 | 7.8 | 25 |
| | B | 10 | 10 | 10 | 8.0 | 5.9 | 5.9 | | | 24.3 | | | 7.8 | |
| | C | 10 | 10 | 10 | 8.0 | 5.7 | 5.8 | | | 24.3 | | | 7.8 | |
| | D | 10 | 10 | 10 | 8.0 | 5.5 | 5.8 | | | 24.3 | | | 7.8 | |
| 50% | A | 10 | 10 | 9/1* | 7.9 | 5.6 | 5.6 | 24.4 | 24.2 | 24.3 | 8.1 | 7.9 | 8.0 | 25 |
| | B | 10 | 10 | 10 | 7.9 | 5.5 | 5.5 | | | 24.4 | | | 8.0 | |
| | C | 10 | 10 | 10 | 7.9 | 5.6 | 5.5 | | | 24.4 | | | 8.0 | |
| | D | 10 | 10 | 10 | 7.9 | 5.6 | 5.6 | | | 24.4 | | | 8.0 | |
| 100 % | A | 10 | 10 | 10 | 8.0 | 5.3 | 5.6 | 24.0 | 24.2 | 24.4 | 8.2 | 8.0 | 8.0 | 25 |
| | B | 10 | 10 | 10 | 8.0 | 5.1 | 5.6 | | | 24.4 | | | 8.0 | |
| | C | 10 | 10 | 10 | 8.0 | 5.2 | 5.6 | | | 24.4 | | | 8.0 | |
| | D | 10 | 10 | 9/1* | 8.0 | 5.2 | 5.6 | | | 24.4 | | | 8.0 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Tech Initials | | 03 | 10 | 03 | | | | | | | | | | |

Reviewed By: kw

Date: 9/14/10

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

MINIMUM REQUIRED TRIM IS TOO LARGE: 97.5, SO SK IS NOT CALCULABLE.
SPEARMAN-KARBER

TRIM: .00%

LC50: .000

95% CONFIDENCE LIMITS
ARE UNRELIABLE.

| CONC. % | NUMBER EXPOSED | NUMBER DEAD | PERCENT DEAD | BINOMIAL PROB. (%) |
|------------|-------------------|----------------|-----------------|-----------------------|
| 6.25 | 40. | 0. | .00 | .9095D-10 |
| 12.50 | 40. | 1. | 2.50 | .3729D-08 |
| 25.00 | 40. | 0. | .00 | .9095D-10 |
| 50.00 | 40. | 1. | 2.50 | .3729D-08 |
| 100.00 | 40. | 1. | 2.50 | .3729D-08 |

THE BINOMIAL TEST SHOWS THAT 100.00 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS 100.0000 PERCENT.
THE LC50 FOR THIS DATA SET IS GREATER THAN 100.00

THE MOVING AVERAGE METHOD CANNOT BE USED WITH THIS DATA SET BECAUSE NO SPAN WHICH PRODUCES AVERAGE ANGLES BRACKETING 45 DEGREES ALSO USES TWO PERCENT DEAD BETWEEN 0 AND 100 PERCENT.

NO CONVERGENCE IN 25 ITERATIONS. PROBIT METHOD PROBABLY CAN NOT BE USE WITH THIS SET OF DATA.

DATE: 8/24/10
SAMPLE: Exxon-Mobil

TEST NUMBER: 30-2061 DURATION: 48 Hours
SPECIES: m.bahia

| METHOD | LC50 | CONFIDENCE LIMITS | | |
|----------|-------|-------------------|-------|-------|
| | | LOWER | UPPER | SPAN |
| BINOMIAL | ***** | 100.000 | ***** | ***** |
| MAA | ***** | ***** | ***** | ***** |
| PROBIT | ***** | ***** | ***** | ***** |
| SPEARMAN | .000 | ***** | ***** | ***** |

NOTE: MORTALITY PROPORTIONS WERE NOT MONOTONICALLY INCREASING.
ADJUSTMENTS WERE MADE PRIOR TO SPEARMAN-KARBER ESTIMATION.

*** = LIMIT DOES NOT EXIST

NEB SALTWATER SPECIES ACCLIMATION RECORD

| | | | |
|---------------------------------------------------------|---------------------|---------------------------------------|-------------------------------------|
| Species: <i>Mysidopsis bairia</i> | Client: Exxon-Mobil | Quantity: 647 | * Mortality upon arrival: NA |
| Source: NEB | Test ID: | Age: 3 days on 8-23-10 | |
| Allowable Mortality: > 5% mortality = Notify management | | * Mortality > 10% - Notify management | |

> 5% mortality = Notify management.

Fish = No more than 50% tank volume water change over a 12 (twelve) hour period.

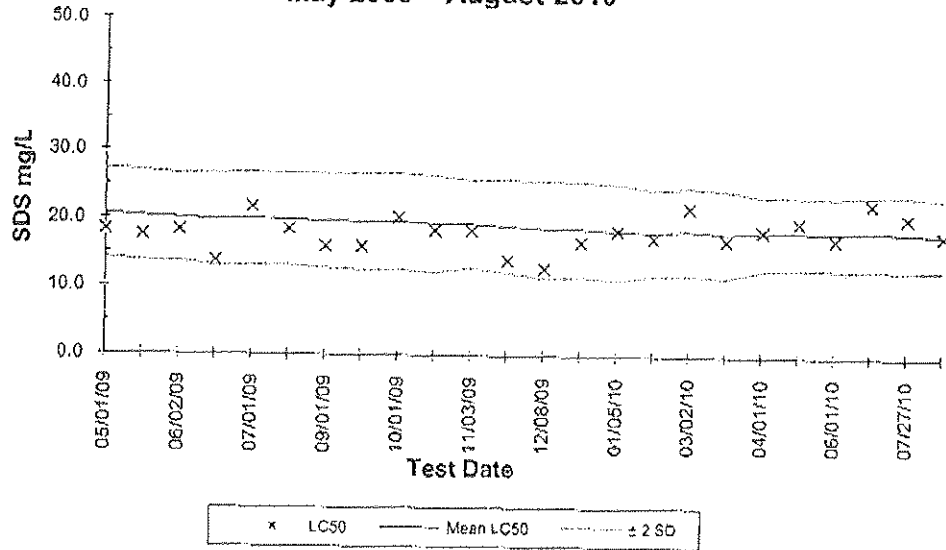
Hold all organisms at least 24 Hrs. at test temperature.

Hold all organisms at least 24 Hrs. at test temperature.

^{xx} Salinity shall not exceed a 3 ppt change within a 12 Hr. period.

[illegible]

Sodium Dodecyl Sulfate: LC50
Mysidopsis bahia
May 2009 - August 2010



| Test ID | Date | LC ₅₀ | Mean LC ₅₀ | STD | -2STD | +2STD | CV % |
|---------|------------|------------------|-----------------------|-----|-------|-------|-----------|
| 29-1442 | 5/1/2009 | 18.3 | 20.7 | 3.3 | 14.1 | 27.2 | 15.8 48 h |
| 29-1457 | 5/5/2009 | 17.5 | 20.3 | 3.3 | 13.7 | 27.0 | 16.3 96 h |
| 29-1563 | 6/2/2009 | 18.3 | 20.1 | 3.2 | 13.7 | 26.6 | 16.0 96 h |
| 29-1694 | 7/1/2009 | 13.8 | 19.8 | 3.4 | 13.0 | 26.6 | 17.1 96 h |
| 29-1698 | 7/1/2009 | 21.8 | 20.0 | 3.4 | 13.2 | 26.8 | 17.0 48 h |
| 29-1881 | 8/5/2009 | 18.5 | 19.9 | 3.4 | 13.1 | 26.7 | 17.0 48 h |
| 29-1994 | 9/1/2009 | 15.9 | 19.7 | 3.5 | 12.7 | 26.7 | 17.7 48 h |
| 29-2108 | 9/22/2009 | 15.9 | 19.6 | 3.6 | 12.5 | 26.7 | 18.1 96 h |
| 29-2202 | 10/1/2009 | 20.3 | 19.7 | 3.6 | 12.6 | 26.8 | 18.1 48 h |
| 29-2273 | 10/13/2009 | 18.3 | 19.3 | 3.6 | 12.2 | 26.5 | 18.4 96 h |
| 29-2356 | 11/3/2009 | 18.3 | 19.3 | 3.2 | 12.8 | 25.8 | 16.8 48 h |
| 29-2433 | 12/1/2009 | 13.9 | 19.0 | 3.4 | 12.2 | 25.8 | 18.0 48 h |
| 29-2459 | 12/8/2009 | 12.8 | 18.6 | 3.6 | 11.4 | 25.8 | 19.3 96 h |
| 30-1008 | 1/4/2010 | 16.6 | 18.6 | 3.6 | 11.5 | 25.7 | 19.1 48 h |
| 30-1011 | 1/5/2010 | 18.3 | 18.2 | 3.5 | 11.1 | 25.3 | 19.5 96 h |
| 30-1110 | 2/1/2010 | 17.2 | 18.1 | 3.2 | 11.8 | 24.5 | 17.5 48 h |
| 30-1248 | 3/2/2010 | 21.8 | 18.4 | 3.2 | 11.9 | 24.9 | 17.7 48 h |
| 30-1251 | 3/2/2010 | 16.9 | 18.0 | 3.2 | 11.5 | 24.4 | 18.0 96 h |
| 30-1387 | 4/1/2010 | 18.3 | 18.1 | 2.7 | 12.7 | 23.5 | 15.0 48 h |
| 30-1546 | 5/6/2010 | 19.6 | 18.2 | 2.7 | 12.9 | 23.5 | 14.6 48 h |
| 30-1638 | 6/1/2010 | 17.1 | 18.0 | 2.7 | 12.7 | 23.3 | 14.8 48 h |
| 30-1768 | 7/1/2010 | 22.4 | 18.2 | 2.7 | 12.7 | 23.7 | 15.0 48 h |
| 30-1917 | 7/27/2010 | 20.3 | 18.1 | 2.8 | 12.6 | 23.7 | 15.2 96 h |
| 30-1983 | 8/5/2010 | 17.7 | 17.9 | 2.6 | 12.7 | 23.2 | 14.7 48 h |